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Liquid Crystals as Stationary Phases (Or, How I Learned to Love Anisotropic Liquids)

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At times I have felt more like a witch doctor or a soothsayer than a scientist. This feeling usually occurs when I'm asked to produce the magic column for a particular gas chromatographic separation. Having met with reasonable success in predicting the correct stationary phase to employ, I have managed, over the years, to build up a Merlin-like reputation among some of my colleagues and graduate students. To this observer, organic chemists seemed to be the most impressionable, and, accordingly, were usually given the desired information and the magic column with the maximum flourish and pageantry. This was to ensure that the "people" would return to Delphi time and again, and in even greater awe of the Oracle. However, to my dismay, I have been finding it increasingly more difficult to promote my image. The "people" are becoming too educated in the ways of column selection.

The simple subterfuge used in the past was that of withholding my sources of information. With the right references handy, choosing a decent column is, for most separations, as easy as hitting the broad side of a barn (cliché intended). I recall, in the film based on "A Connecticut Yankee in King Arthur's Court," how Bing Crosby, with the aid of an almanac, successfully predicted an eclipse of the sun, thereby stunning the "people" into believing in his powers.

In the not-so-distant past, graduate student in organic chemistry would approach me with a mixture of nonpolar compounds which had a reasonably large boiling-point spread. I would hand him an efficient squalane column, urge him to review basic separations theory, pat him patronizingly on the back, and send him on his way to a lab equipped with a Model 154 Vapor Fractometer. A few months later, having done a minimum of reading, he would return

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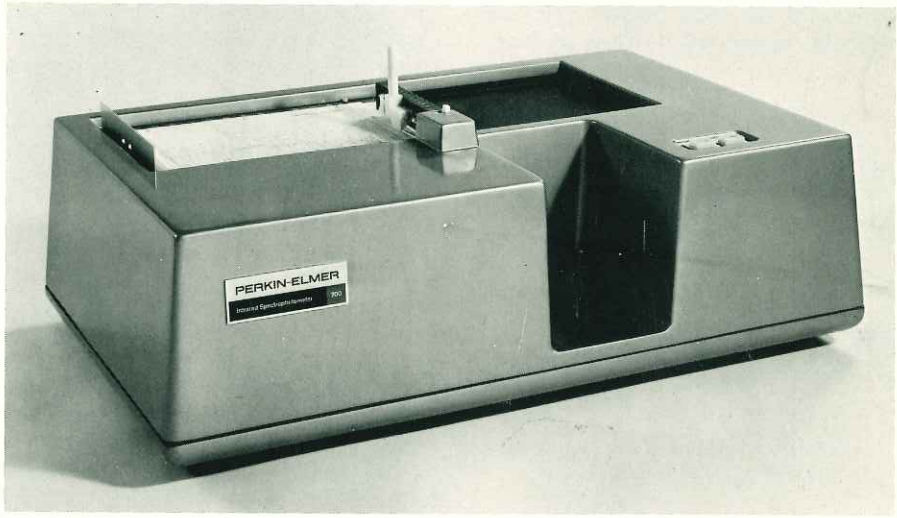
The New Perkin-Elmer Model 700 Infrared Spectrophotometer Brings High Performance IR Analysis within the Reach of Almost Every Lab.



The Perkin-Elmer Model 700 Infrared Spectrophotometer

The Model 700 Infrared Spectrophotometer, introduced in January of this year at a price of $3,000 (list price f.o.b. Norwalk), extends the advantages of infrared analysis to an entirely new group of users who, until now, have not been able to budget the cost of this instrumentation.

The Model 700 is a double beam, optical null, filter-grating spectrophotometer with a frequency range of 4000 to 650 cm^{-1}. Despite its low cost, it offers performance that is fully adequate for routine, day-to-day use in both industrial laboratories and in colleges and junior colleges. Resolution is specified to be better than 5 cm^{-1} at 1000 cm^{-1}, and better than 10 cm^{-1} at 3000 cm^{-1} — more than adequate, for example, to identify and distinguish between the various carbonyl absorptions which occur in the 1700-1800 cm^{-1} region of the spectrum.

Continuous, unbroken spectra are presented on a linear frequency scale with a 2:1 scale change at 2000 cm^{-1}. The spectra may be compared directly with reference libraries of spectra for the identification of unknown samples.

The sample space, with an optical path length of more than five inches, is large enough to accommodate all the commonly used infrared accessories including internal reflectance attachments (ATR and FMIR), specular reflectance attachments, refracting beam condensers, variable path length liquid cells, and Perkin-Elmer wire grid polarizers. Two, five, and ten cm gas cells, as well as a variety of sealed and demountable cells, can also be accommodated.

Simple Operation

Simplicity of operation characterizes the Model 700. There are only three operating controls: a POWER switch which controls all power to the instrument, a SCAN button which starts the automatic scan, and a 100% ADJUST, or full scale control. Even an inexperienced operator can be taught to use the instrument in a matter of minutes. Chart paper, in convenient 8½ x 11" notebook size, comes in pads of thirty sheets. A pad of paper is clamped on the recorder platen; at the end of each scan the operator tears off the top sheet with the

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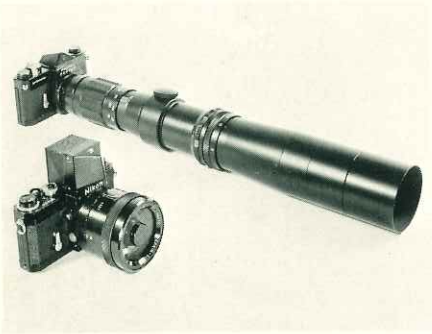
Perkin-Elmer Scientists Develop the "Solid Cat," An Entirely New Concept In Long Focal Length Lenses

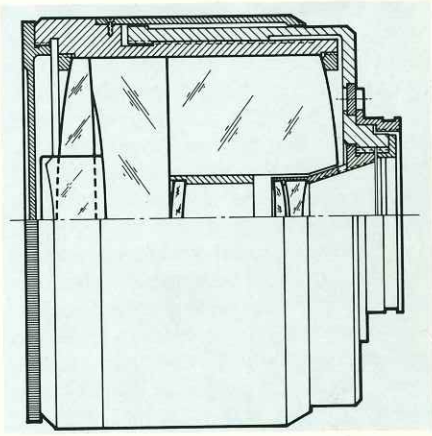
Until now, the photographer who needed a long focal length lens to photograph distant objects was forced to use a lens whose physical length approached the focal length. Even the telephoto lenses were large and unwieldy. Perkin-Elmer has recently developed a lens of 680 mm (26.5 inch) focal length whose physical dimensions are 3.12 inches in diameter and 2.90 inches long (Figure 1). The new lens weighs 1.64 pounds. The "Solid Cat" derives its nickname from the fact that it employs mostly glass, with few air spaces, in its construction and that it is of *cat*adioptric design, i.e., it employs both reflective and refractive elements (Figure 2).

The "Solid Cat" may be fitted to any of a number of 35 mm cameras, including the Nikon, Topcon, Contarex, and Pentax. It offers diffraction limited performance and may be used with black and white or color film. The "Solid Cat" is expected to cost approximately $2300.

Several photographs taken with the "Solid Cat" are shown below, together with photographs of the same scene taken at approximately the same time with a conventional 50 mm lens. It is interesting to note that all of the photographs taken with the "Solid Cat" were hand-held—no tripod was used!



Top—Pentax with 500 mm telephoto
Bottom—Nikon with "Solid Cat"



Cross-section of the "Solid Cat"

Taken with 50 mm lens

The same scene taken with "Solid Cat"

Taken with 50 mm lens

The same scene taken with "Solid Cat"

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